

CLAIMS

1. A method of announcing to a user the presence of a real or virtual entity, or a representation of it, in a current environment of the user, wherein the entity or its representation is announced to the user using an audio announcement that has a presentation character at least one aspect of which, other than or additional to its loudness, is set in dependence on the range distance between the user and the entity, or its representation, in the current environment.
2. A method according to claim 1, comprising the steps of:
 - (a) determining the range distance between the user and said entity, or its representation, in the current environment;
 - (b) selecting, on the basis of the range distance determined in step (a), one announcement from multiple available announcements that have respective presentation characters differing from each other in said at least one aspect;
 - (c) retrieving stored announcement data for the announcement selected in step (b);
 - (d) using the retrieved announcement data to generate said audio announcement.
3. A method according to claim 1, comprising the steps of:
 - (a) determining the range distance between the user and said entity, or its representation, in the current environment;
 - (b) selecting, on the basis of the range distance determined in step (a), one presentation character from multiple available presentation characters that differ from each other in said at least one aspect;
 - (c) retrieving stored announcement data; and
 - (d) generating said audio announcement using the retrieved announcement data and such as to impart to it the presentation character selected in step (b).
4. A method according to claim 1, wherein the announcement made includes a component personalised to the user.

5. A method according to claim 1, wherein said at least one aspect of the presentation character is one of:

- speaking style;
- vocabulary;
- 5 - speaker voice.

6. A method according to claim 1, wherein the announcement is made when the range distance reaches any one of a set of trigger values, the announcement presentation character being dependent on the trigger value reached.

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7. A method according to claim 1, wherein the announcement is made at periodic intervals with the announcement presentation character being dependent on the current range distance value.

15 8. A method according to claim 1, wherein said current user environment is an audio field in which items are represented by corresponding synthesized sound sources from where sounds related to the items appear to emanate, one such item constituting said entity with the corresponding sound source forming a said representation of the entity in the audio field, and the audio announcement having a presentation character the said at least one
20 aspect of which is dependent on the range distance between the user and the location in the audio field of the sound source representing said entity.

9. A method according to claim 8, wherein said entity is a real-world entity with a real-world location, the sound source representing the entity being positioned in the audio field
25 at a range distance value from the user dependent on the actual distance between the user and said real-world location.

10. A method according to claim 8, wherein said entity is an augmented reality service that has an associated real-world location, the sound source representing the entity being
30 positioned in the audio field at a range distance value from the user dependent on the actual distance between the user and said real-world location.

11. A method according to claim 1, wherein the said current user environment is the current real-world environment of the user and said entity is a real-world entity with the said at least one aspect of the audio-announcement presentation character being set in dependence on the range distance between the user and the real-world entity itself.

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12. A method according to claim 11, wherein the range distance between the user and the entity is determined by range-determining equipment at one of the entity, the user, and generally in the environment, either alone or in cooperation with auxiliary range-determining equipment at another of the entity, the user, and generally in the environment; the range distance being provided to selection equipment at one of the user, the entity, and generally in the environment, in order to determine the announcement presentation character to be used.

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13. A method according to claim 11, wherein said audio announcement is made by announcement equipment at the entity using announcement data retrieved from a data store at one of one of the entity, the user, and generally in the environment.

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14. A method according to claim 11, wherein said audio announcement is made by announcement equipment at the user using announcement data retrieved from a data store at one of one of the entity, the user, and generally in the environment.

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15. A method according to claim 11, wherein said audio announcement is made by announcement equipment generally in the environment using announcement data retrieved from a data store at one of one of the entity, the user, and generally in the environment.

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16. Apparatus for providing an audio user interface in which items are represented in an audio field by corresponding synthesized sound sources from where sounds related to the items appear to emanate, the apparatus comprising:

- rendering-position determining means for determining, for each said sound source, an associated rendering position at which the sound source is to be synthesized to sound in the audio field;
- rendering means, including audio output devices, for generating an audio field in

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which said sound sources are synthesized at their associated rendering positions, the audio output devices being such as to permit the user also to hear real-world sounds from the environment; and

- announcement-control means for causing at least one said item to be announced to the user, via the corresponding sound source, using an audio announcement that has a presentation character at least one aspect of which, other than or additional to its loudness, is set in dependence on a range distance between the user and the location of the sound source in the audio field.

10 17. Apparatus according to claim 16, wherein a said at least one item to be announced to the user is a real-world entity with a real-world location, the rendering-position determining means being operative to receive data on the actual distance between the user and said real-world location and to position the sound source representing the real-world entity in the audio field at a range distance value from the user dependent on said actual distance.

15 18. Apparatus according to claim 16, wherein a said at least one item to be announced to the user is an augmented reality service that has an associated real-world location, the rendering-position determining means being operative to receive data on the actual distance between the user and said real-world location and to position the sound source representing the augmented reality service in the audio field at a range distance value from the user dependent on said actual distance.

20 19. Apparatus according to claim 16, wherein the announcement-control means includes a data store for holding, for each said at least one item to be announced to the user, announcement data for multiple announcements that have respective presentation characters differing from each other in said at least one aspect; the announcement-control means being operative to select, for each said at least one item to be announced to the user, the appropriate announcement data for the said range distance concerned, the rendering means being operative to use the selected announcement data to produce an announcement at the determined rendering position of the corresponding sound source.

20. Apparatus according to claim 16, wherein the announcement-control means includes a data store for holding announcement data for each said at least one item to be announced to the user, and means for applying to an announcement a selected one of multiple different presentation characters that differ from each other in said at least one aspect; the
 5 announcement-control means being operative to select, for each said at least one item to be announced to the user, the appropriate presentation character which it then applies to the corresponding announcement data such as to cause the rendering means to produce an announcement with the selected presentation character at the determined rendering position of the corresponding sound source.

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21. Apparatus according to claim 16, wherein the said at least one aspect of presentation character is one of:

- speaking style;
- vocabulary;
- 15 - speaker voice.

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22. Apparatus for announcing to a user the presence of a real-world entity in the user's current environment, the apparatus comprising:

- storage means for storing announcement data for multiple announcements that have
 20 respective presentation characters differing from each other in at least one aspect other than, or additional to, loudness;
- means for determining a range distance between the user and said entity;
- means for selecting, on the basis of the determined range distance one announcement from said multiple announcements;
- 25 - means for retrieving, from said storage means, the announcement data for the selected announcement; and
- means for generating an audio announcement using the retrieved announcement data.

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23. Apparatus according to claim 22, wherein the announcement is arranged to be made
 30 when the range distance reaches any one of a set of trigger values, the announcement presentation character being dependent on the trigger value reached.

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24. Apparatus according to claim 22, wherein the announcement is arranged to be made at periodic intervals with the announcement presentation character being dependent on the current range distance value.

5 25. Apparatus according to claim 22, wherein the said at least one aspect of presentation character is one of:

- speaking style;
- vocabulary;
- speaker voice.

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26. Apparatus for announcing to a user the presence of a real-world entity in the user's current environment, the apparatus comprising:

- storage means for storing announcement data;
- means for determining a range distance between the user and said entity;
- 15 - means for selecting, on the basis of the determined range distance, one presentation character from multiple available presentation characters that differ from each other in at least one aspect other than, or additional to, loudness;
- means for retrieving the announcement data from the storage means; and
- means for generating an audio announcement using the retrieved announcement data
- 20 and such as to impart to it the presentation character selected.

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27. Apparatus according to claim 26, wherein the announcement is arranged to be made when the range distance reaches any one of a set of trigger values, the announcement presentation character being dependent on the trigger value reached.

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28. Apparatus according to claim 26, wherein the announcement is arranged to be made at periodic intervals with the announcement presentation character being dependent on the current range distance value.

30 29. Apparatus according to claim 26, wherein the said at least one aspect of presentation character is one of:

- speaking style;

- vocabulary;
- speaker voice.

5 **30.** Apparatus for providing an audio user interface in which items are represented in an audio field by corresponding synthesized sound sources from where sounds related to the items appear to emanate, the apparatus comprising:

- a rendering-position determining arrangement operative to determine, for each said sound source, an associated rendering position at which the sound source is to be synthesized to sound in the audio field;

10 - a rendering subsystem, including audio output devices, arranged to generate an audio field in which said sound sources are synthesized at their associated rendering positions, the audio output devices being such as to permit the user also to hear real-world sounds from the environment; and

15 - an announcement-control arrangement operative to cause at least one said item to be announced to the user, via the corresponding sound source, using an audio announcement that has a presentation character at least one aspect of which, other than or additional to its loudness, is set in dependence on a range distance between the user and the location of the sound source in the audio field.

20 **31.** Apparatus according to claim 30, wherein a said at least one item to be announced to the user is a real-world entity with a real-world location, the rendering-position determining arrangement being operative to receive data on the actual distance between the user and said real-world location and to position the sound source representing the real-world entity in the audio field at a range distance value from the user dependent on said
25 actual distance.

32. Apparatus according to claim 30, wherein a said at least one item to be announced to the user is an augmented reality service that has an associated real-world location, the rendering-position determining arrangement being operative to receive data on the actual
30 distance between the user and said real-world location and to position the sound source representing the augmented reality service in the audio field at a range distance value from the user dependent on said actual distance.

33. Apparatus according to claim 30, wherein the announcement-control arrangement includes a data store for holding, for each said at least one item to be announced to the user, announcement data for multiple announcements that have respective presentation characters differing from each other in said at least one aspect; the announcement-control arrangement being operative to select, for each said at least one item to be announced to the user, the appropriate announcement data for the said range distance concerned, the rendering subsystem being operative to use the selected announcement data to produce an announcement at the determined rendering position of the corresponding sound source.

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34. Apparatus according to claim 30, wherein the announcement-control arrangement includes a data store for holding announcement data for each said at least one item to be announced to the user, and an arrangement operative to apply to an announcement a selected one of multiple different presentation characters that differ from each other in said at least one aspect; the announcement-control arrangement being operative to select, for each said at least one item to be announced to the user, the appropriate presentation character which it then applies to the corresponding announcement data such as to cause the rendering subsystem to produce an announcement with the selected presentation character at the determined rendering position of the corresponding sound source.

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35. Apparatus according to claim 30, wherein the said at least one aspect of presentation character is one of:

- speaking style;
- vocabulary;
- speaker voice.

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36. Apparatus for announcing to a user the presence of a real-world entity in the user's current environment, the apparatus comprising:

- a data store for storing announcement data for multiple announcements that have respective presentation characters differing from each other in at least one aspect other than, or additional to, loudness;

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- an arrangement operative to determine a range distance between the user and said entity;
- an arrangement operative to select, on the basis of the determined range distance one announcement from said multiple announcements;
- 5 - an arrangement operative to retrieve, from said store, the announcement data for the selected announcement; and
- an arrangement operative to generate an audio announcement using the retrieved announcement data.

10 **37.** Apparatus according to claim 36, wherein the announcement is arranged to be made when the range distance reaches any one of a set of trigger values, the announcement presentation character being dependent on the trigger value reached.

15 **38.** Apparatus according to claim 36, wherein the announcement is arranged to be made at periodic intervals with the announcement presentation character being dependent on the current range distance value.

39. Apparatus according to claim 36, wherein the said at least one aspect of presentation character is one of:

- 20
- speaking style;
 - vocabulary;
 - speaker voice.

25 **40.** Apparatus for announcing to a user the presence of a real-world entity in the user's current environment, the apparatus comprising:

- a data store for storing announcement data;
- an arrangement operative to determine a range distance between the user and said entity;
- an arrangement operative to select, on the basis of the determined range distance, one presentation character from multiple available presentation characters that differ from each other in at least one aspect other than, or additional to, loudness;
- 30 - an arrangement operative to retrieve the announcement data from the data store; and

- an arrangement operative to generate an audio announcement using the retrieved announcement data and such as to impart to it the presentation character selected.

5 **41.** Apparatus according to claim 40, wherein the announcement is arranged to be made when the range distance reaches any one of a set of trigger values, the announcement presentation character being dependent on the trigger value reached.

10 **42.** Apparatus according to claim 40, wherein the announcement is arranged to be made at periodic intervals with the announcement presentation character being dependent on the current range distance value.

43. Apparatus according to claim 40, wherein the said at least one aspect of presentation character is one of:

- 15
- speaking style;
 - vocabulary;
 - speaker voice.

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